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## Measurement of Atrial Refractoriness Dispersion: Is There a Better Way?*

The electrographic characteristic of atrial fibrillation and its correlation with atrial refractoriness have been investigated recently by Li et al. (1). This study, in my view, has indeed provided some useful information to our current knowledge of the mechanism of atrial fibrillation that has puzzled many investigators for years. In this article (1), the duration of atrial fibrillation was found to correlate moderately well with the atrial effective refractory period in the right posterior lateral wall in a canine atrial fibrillation model established by rapid atrial pacing. However, no significant relation between the duration of the fibrillation and the dispersion of effective refractoriness was documented. This result is obviously, as the authors point out (1), in conflict with the study by Wang et al. (2) in which atrial refractoriness dispersion was found to be the only predictor of duration of atrial fibrillation. Also in conflict with the report by Li et al. is another study in humans (3) in which increased atrial refractoriness dispersion was responsible for the recurrence of atrial fibrillation. Li et al. (1) assumed that their result differed with regard to the association of fibrillation duration and local refractoriness dispersion because of the different animal models that they used or because of some other essentially unknown reasons. However, I suggest that the disparity between their results and those of the other two studies may be largely attributed to the technique they used to measure atrial refractoriness and its dispersion.

The classical method for the measurement of atrial refractoriness, as used by Li et al. (1), is to introduce an extrastimulus in progressively shorter coupling intervals until the extrastimulus fails to generate an atrial response. The major limitation of this technique is its inability to detect the local refractoriness in multiple atrial sites simultaneously. This technical drawback may have limited its role in the assessment of the dispersion of atrial refractoriness. As an alternative, averaged local fibrillation intervals have been used as an index for local refractoriness (4), based on the assumption that during the fibrillation, cells regain their excitability as soon as their refractory period ends. The atrial refractoriness measured in this way has been shown to correlate well with the effective refractory period determined by the classical extrastimulus technique in both animals (4) and humans (3). Although the averaged atrial fibrillation interval is not necessarily a true refractory period, and it can only be regarded as a limit of refractoriness, it indeed allows the assessment of refractory period at multiple sites simultaneously. It should be appreciated that atrial fibrillation interval as an index of local atrial refractoriness is still far from widespread clinical use; however, its application in experimental studies of refractoriness or refractoriness dispersion may need to be encouraged.

LEXIN WANG, MD
*Department of Medicine*
*University of Tasmania School of Medicine*
*43 Collins Street, Hobart*
*Tasmania 7000, Australia*

*The authors of the cited study have declined to prepare a response to this letter.

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